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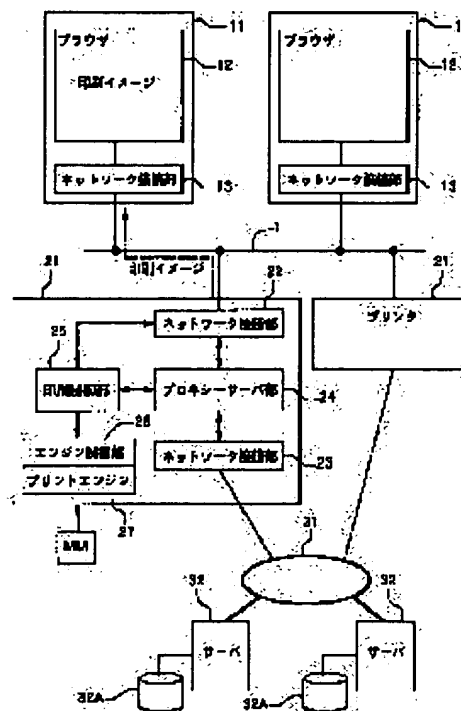
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(54) NETWORK PRINTING SYSTEM, NETWORK PRINTER AND NETWORK PRINTING METHOD

(57)Abstract:

PROBLEM TO BE SOLVED: To easily print information resources on the Internet and to easily obtain a preview screen on which printing performance is reflected.

SOLUTION: A printer 21 is provided with a proxy server part 24. A desired URL is inputted in a browser 12 after the printer to be used as a proxy server is selected by a user. The requested information resources are acquired from a cache in the printer 21 or a server 32 on the Internet 31 and transferred to the browser 12 by the proxy server part 24. When printing preview is desired by the user, printing image data generated by a printing control part 25 are transmitted to the browser 12. When printing is instructed by the user by whom the preview screen is confirmed, data stored in the cache are read and printed by the printing control part 25.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the network printing system, network printer, and the network printing approach of relaying an information resource between a host computer and a server especially about the network printing system, network printer, and the network printing approach of acquiring and printing the information resource which exists on networks, such as the Internet.

[0002]

[Description of the Prior Art] For example, the network printer which is connected to networks, such as LAN (Local Area Network), and is shared with two or more host computers is known conventionally. This network printer prints by receiving a print job from two or more host computers connected to the network. On the other hand, the Internet is known as a network of the global scale which comes to connect many networks mutually.

[0003] That is, the Internet is the network of the global scale which comes to interconnect in some trunk-line data service networks, and TCP/IP (Transmission Control Protocol/Internet Protocol), HTTP (Hypertext Transfer Protocol), etc. are used for it in order to perform data communication etc. between the servers of a different model. Each server on a network has usually memorized two or more information resources in a spool. As an information resource, the web page which a WWW (World Wide Web) server offers, the file which a FTP (File Transfer Protocol) server offers, the NetNews which a news server offers are known, for example.

[0004] The various information resources which each server holds can be used for host computers, such as a personal computer, by accessing the Internet through a router etc. For example, when a user wishes printing of the web page displayed on the web browser, the data of a web page downloaded from the server are made to transmit to a printer. A printer prints by receiving and interpreting the data of a web page.

[0005]

[Problem(s) to be Solved by the Invention] With the conventional technique mentioned above, when the information resource which the server on the Internet holds comes to hand as printed matter, a user has to start [1st] a host computer, has to access a desired server, and has to transmit to a printer the data which downloaded the target data in the host computer and were downloaded [2nd] to the 3rd. Here, if transmitting anew the data received on LAN from the Internet to a printer requires time and effort and the same data are repeatedly circulated on LAN, a communication link load will increase and transmission speed will fall, because the data of a web page are transmitted to the host computer through LAN etc.

[0006] On the other hand, the web page described by HTML (HyperText Markup Language) lacks the concept of a page, and the appearance of the display screen and an actual printing condition tend to be different, when printing the web page displayed on the browser, since a screen may be divided and displayed on two or more frames. In some browsers, since it has the print preview function, the condition of printed matter can be checked beforehand. However, the print preview screen generated by

the browser side is created only based on the data downloaded to the host computer, and since it is not taking into consideration the engine performance of the printer used for printing etc., it is different from an actual printing result.

[0007] If a typical example is given, even when a color printer does not exist in a printer with an available host computer, color display will be carried out on the print preview screen of a browser, but since actual printed matter is monochrome printing, the difference with a print preview screen is remarkable. Thus, the printing result when printing a web page is different with various engine performance, such as propriety of the print resolution of a printer, feed size, a color / monochrome printing. Like a complicated graph and minute static-image data, although it may have the main value in a variegated and minute expression depending on a web page, even if it prints the web page of such rich power of expression by the scarce printer of printing power of expression, worth of printed matter will be scarce and will cause only the result which exhausts printing resources, such as a toner and a form, vainly.

[0008] Of course, when a user chooses a suitable printer beforehand out of an available printer and directs printing, sense of incongruity with a print preview screen can be lessened. However, since the print preview screen generated by the browser side as above-mentioned is not reflecting the engine performance of the selected printer, it cannot judge whether it is a suitable printer only by seeing a print preview screen.

[0009] Especially in the case of the network printing system which shares two or more printers connected to the network with two or more host computers, it is difficult that a user grasps the engine performance of each printer correctly. Therefore, in many cases, a user will notice the mistake of printer selection, after looking at the printing result of a web page.

[0010] This invention is made in view of the above various technical problems, and the purpose is to offer the network printing system, network printer, and the network printing approach of displaying the printing image data in which the engine performance of a printer was made to reflect by the host computer side while being able to receive and print the information resource on a network, without increasing a communication link load.

[0011]

[Means for Solving the Problem] In the network printing system concerning this invention, the printing image data which connected through the junction function of a printer and generated the host computer and the server by the printer side is transmitted to the host computer for the above-mentioned purpose achievement.

[0012] Namely, the host computer which directs printing of this information resource while invention concerning claim 1 requires acquisition of the information resource saved at the server on a network, In the network printing system equipped with the printer which receives and prints the information resource of which acquisition was required from this host computer from said server said host computer The acquisition demand means for requiring acquisition of said information resource of said printer, It has a printing directions means to direct printing of the information resource acquired by said acquisition demand means to said printer. Said printer While acquiring the information resource demanded from said acquisition demand means from said server and saving it It is based on directions from a junction means to transmit this information resource to said host computer, and said printing directions means. It is characterized by having the printing control means which makes the information resource saved for said junction means read and print, and for said junction means making said information resource a printing image data according to the demand from said host computer, and making it transmit to said host computer.

[0013] Here, "the server on a network" means the server connected to networks, such as the Internet, intranet, and LAN, and a "information resource" includes the web page which for example, a WWW server offers, the file which a FTP server offers. A "printing image data" shows the condition when printing an information resource.

[0014] The acquisition demand means by the side of a host computer requires acquisition of an information resource of the junction means by the side of a printer by specifying a protocol name, a

server address, a file name, etc. like "http://xxx.xxx.xxx.xxx/abc/japanese/seihinn/device/device.htm." It connects with the server directed by the acquisition demand means, and a junction means relays data communication between a server and a host computer, and transmits the information resource on a server to a host computer. Moreover, a junction means saves the information resource which carries out a junction transfer. Before he directs printing, he makes transmission of a printing image data require, when a user checks the information resource displayed on the host computer side and wishes to print. A junction means transmits the printing image data of an information resource according to the demand from a host computer. A user can direct printing, after checking a printing image data. And if printing of an information resource is directed by the printing directions means, a printing control means will read and print the information resource saved for the junction means.

[0015] Thus, since the junction means of a printer plays a role of a proxy server of saving an information resource, relaying a transfer of an information resource between a host computer and a server, when directing printing through a printing directions means, it does not have the need of transmitting an information resource to a printer side from a host computer side, and can reduce a communication link load. Moreover, since a junction means can transmit an information resource as a printing image data according to the demand from a host computer, a user can give directions of printing, after checking the printing image data in which the actual printing engine performance was reflected.

[0016] Said junction means judges whether the information resource of which acquisition was required from a preservation means save the acquired information resource, and said acquisition demand means is saved for said preservation means, when the information resource is saved, like invention concerning claim 2, it acquires the information resource concerned from said preservation means, and when the information resource is not saved, you may also contain a data-control means acquire the information resource concerned from said server.

[0017] As a "preservation means", although various storage, such as a hard disk drive unit and a memory apparatus, can be used for example, rewritable storage is desirable. The information resource relayed by the junction means is saved by the preservation means.

[0018] If acquisition of an information resource is required from an acquisition demand means, a data control means will judge whether this demanded information resource is saved for the preservation means. The information resource saved for the preservation means when already saved is read, it transmits to a host computer side, and when not saved, it connects with a server, the newest information resource comes to hand, and it transmits to a host computer side. Here, the information resource on a server is updated, and also when the contents of the information resource saved for the preservation means are old, the information resource concerning an acquisition demand can judge with what is not saved for a preservation means, and can connect with a server.

[0019] Like invention concerning claim 3, said junction means An updating demand judging means to judge whether the updating demand of the information resource about said printer occurred, and when it is judged with said updating demand having occurred An updating judging means to judge whether it connects with said network and the information resource about said printer is updated on said server, When judged with the information resource about said printer being updated on said server, you may acquire this information resource from said server, and may also include further the updating storage means which carries out updating storage in said preservation means.

[0020] "The information resource about a printer" means the program and data file about the printer by which the junction means was established, and, more specifically, document data, such as a program of a printer driver, a printer utility, etc. and an operation manual, can be mentioned. "An updating demand" is a demand for urging updating storage of the information resource about a printer. For example, an updating demand can be generated for every predetermined time like [in every / every week and / month]. Moreover, an updating demand can also be generated by, for example, notifying the purport to which renewal of the information resource about a printer was carried out to the junction means from a server side using techniques, such as IP (Internet Protocol) broadcasting.

[0021] If an updating demand occurs, an updating judging means is connected to a server (typically, it is a printer manufacturer's server), when it is judged and updated whether the information resource about a

printer is updated, the newest information resource will be acquired from a server and updating storage will be carried out at a preservation means. All the host computers using the printer concerned need the information resource about a printer. Therefore, each host computer using this printer can obtain the newest information resource through the junction means of a printer, without connecting with the server on a network. If it puts in another way, since it has managed for the printer itself concerned, the information resource about a printer will become easy [unifying the printer use environment of each host computer].

[0022] Said junction means may associate the printing image data of said information resource and information resource concerned, and may be made to save it for said preservation means like invention concerning claim 4.

[0023] After transmitting the printing image data generated from the information resource to a host computer, it can also be discarded immediately. However, a printing image data may be required about the same information resource from other host computers. Then, the response time to a printing image-data transfer request for the second time can be shortened by making the generated printing image data associate and save at an information resource. In addition, it can also be made to save here only within predetermined parts, such as a font, image data, etc. which do not need to save the printing image data of the whole information resource, for example, printing image generation takes time amount. Moreover, the carbon buttons used abundantly at a user interface, a logo mark with high operating frequency, etc. may be attached and saved.

[0024] Like invention concerning claim 5, said junction means can also delete few [the frequency of said acquisition demand] information resources from said preservation means, when the hysteresis of the acquisition demand from said acquisition demand means is managed and the availabilities of said preservation means run short.

[0025] For example, a junction means can grasp hysteresis, such as a name of the information resource demanded from the acquisition demand means, demanded time, and a demanded count, by extracting an access log. And when the availabilities of a preservation means run short, few [the frequency of an acquisition demand] information resources are deleted from a preservation means, and an availability is secured. By this, only the comparatively high information resource of the frequency of an acquisition demand can be saved, a hit mistake can be reduced, and the response time can be shortened.

[0026] Said junction means inspects whether the information resource acquired from said server meets the predetermined criteria set up beforehand, and saves it for said preservation means, when, as for said printing control means, the information resource directed from said printing directions means meets said predetermined criteria, printing permits like invention concerning claim 6, and when said directed information resource does not fill said predetermined criteria, printing can also forbid.

[0027] It can mention whether as "predetermined criteria", it is the information resource which is indirectly [directly or] related to business, for example, and whether it is the information resource of a vicious or antisocial site.

[0028] A junction means inspects whether this information resource meets the predetermined criteria, when receiving an information resource from a server. For example, it can judge whether the predetermined criteria are met by inspecting whether the phrase into which it was registered beforehand whether it is the address registered beforehand is included. Even if it is the information resource which does not meet the predetermined criteria, it is transmitted to a host computer. However, since a printing control means forbids printing when printing of the information resource which does not meet the predetermined criteria is directed, a user cannot obtain this information resource as printed matter. Thereby, printing of antisocial information resources, such as an obscene image and a counterfeit currency image, can be prevented beforehand, and improper use of a printer can be prevented.

[0029] In the network printer which prints this information resource while acquiring the information resource saved at the server on a network in invention concerning claim 7 and transmitting to a host computer The network connection means for connecting with said network and communicating with said host computer and said server, While acquiring the information resource which connected with said server through said network connection means, and was demanded from said host computer from said

server and saving it A junction means to transmit this information resource to said host computer through said network connection means, Based on the directions from said host computer, it has the printing control means which makes the information resource saved for said junction means read and print. Said junction means It judges whether the information resource required as a preservation means to save the acquired information resource, from said host computer is saved for said preservation means. When the information resource is saved, the information resource concerned is acquired from said preservation means. When the information resource is not saved, it is characterized by making it transmit to said host computer by making said information resource into a printing image data according to the demand from said host computer coming [a data control means to acquire the information resource concerned from said server].

[0030] Thereby, the so-called proxy server ability can be given to a printer, and since the printing image data in which the printing engine performance was made to reflect can be transmitted to a host computer, the same operation as invention concerning said claim 2 can be acquired.

[0031] Like invention concerning claim 8, said junction means An updating demand judging means to judge whether the updating demand of the information resource about said printer occurred, and when it is judged with said updating demand having occurred An updating judging means to judge whether it connects with said network and the information resource about said printer is updated on said server, When judged with the information resource about said printer being updated on said server, you may acquire this information resource from said server, and may also include further the updating storage means which carries out updating storage in said preservation means.

[0032] Thereby, the same operation as invention concerning said claim 3 can be acquired.

[0033] Like invention concerning claim 9, said junction means may associate the printing image data of said information resource and information resource concerned, and may save it for said preservation means.

[0034] Thereby, the same operation as invention concerning said claim 4 can be acquired.

[0035] Like invention concerning claim 10, said junction means may delete few [the frequency of said acquisition demand] information resources from said preservation means, when the hysteresis of the acquisition demand from said host computer is managed and the availabilities of said preservation means run short.

[0036] Thereby, the same operation as invention concerning said claim 5 can be acquired.

[0037] Said junction means inspects whether the information resource acquired from said server meets the predetermined criteria set up beforehand, and saves it for said preservation means, when, as for said printing control means, the information resource directed from said printing directions means meets said predetermined criteria, printing permits like invention concerning claim 11, and when said directed information resource does not fill said predetermined criteria, printing can also forbid.

[0038] Thereby, the same operation as invention concerning said claim 6 can be acquired.

[0039] In invention concerning claim 12, the information resource saved at the server on a network according to the acquisition demand from a host computer is acquired. In the network printing approach printed while transmitting this information resource to said host computer, it has junction processing and printing processing. Said junction processing The step which receives the acquisition demand from said host computer, and the step which judges whether the information resource concerning said acquisition demand is saved for the preservation means, When the information resource concerning said acquisition demand is saved for said preservation means When the step which acquires said information resource from said preservation means, and the information resource concerning said acquisition demand are not saved for said preservation means The step which acquires the information resource which connects with said network and is applied to said acquisition demand from said server, The step which saves the information resource acquired from said server for said preservation means, The step which transmits said acquired information resource to said host computer, The step which changes said acquired information resource into a printing image data according to the demand from said host computer, It comes to contain the step which relates said printing image data with the information resource concerning said acquisition demand, and is transmitted to said host computer. Said printing processing It

is characterized by coming to contain the step which judges whether the printing directions from said host computer were received, the step which reads the information resource concerning said printing directions from said preservation means, and the step which prints said read information resource.

[0040] Thereby, the same operation as invention concerning said claim 2 can be acquired.

[0041] In the record medium which recorded the program for controlling by invention concerning claim 13 the network printer which prints this information resource while acquiring the information resource saved at the server on a network and transmitting to a host computer The preservation function to save the information resource acquired from said server for a preservation means, It judges whether the information resource demanded from said host computer is saved for said preservation means. The data administration facility which acquires the information resource concerned from said preservation means when the information resource is saved, and acquires the information resource concerned from said server when the information resource is not saved, The function to change said acquired information resource into a printing image data according to the demand from said host computer, The function which relates said printing image data with said information resource, and is transmitted to said host computer, It is characterized by said computer recording the program for making a computer realize the function to make the information resource saved for said preservation means read and print, according to the directions from said host computer with read and the gestalt which can be understood.

[0042] As a "record medium", various record media, such as a hard disk, a floppy disk, memory, and an IC card, can be used, for example. Moreover, communication media can also be used like downloading a program not only through this but through a network.

[0043] By making a predetermined program read into the computer of a printer, predetermined functions, such as a preservation function and a data administration facility, can be realized on the computer of a printer, and the same operation as invention concerning said claim 2 can be acquired.

[0044]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained to a detail based on a drawing. In addition, in the following explanation, for convenience, although stated focusing on the junction of the web page by the HTTP protocol, the file transfer by the FTP protocol can also be used.

[0045] 1. Gestalt drawing 1 of the 1st operation - drawing 8 show the network printing system by the gestalt of operation of the 1st of this invention. First, drawing 1 is the block diagram showing roughly the whole network printing system configuration by the gestalt of this operation.

[0046] Two or more host computers 11 and two or more network printers (following "printer") 21 are connected to the networks 1, such as LAN. For example, the browser 12 which can be expressed as a perusal means, and the network connection section 13 equipped with the network interface, the predetermined protocol, etc. are formed in the host computer 11 realizable as a personal computer, a Personal Digital Assistant, etc. A browser 12 is a program for perusal etc. to carry out information resources, such as a web page, for example, can access a predetermined server by inputting or specifying URL. Moreover, as shown in drawing 8, the menu for performing printing directions is prepared for the browser 12. Therefore, a browser 12 corresponds to an "acquisition demand means" and a "printing directions means."

[0047] Like the after-mentioned, in addition to the original print facility, each printer 21 is equipped with proxy server ability, and can connect each host computer 11 now to the server 32 on the Internet 31 through the desired printer 21. A printer 21 relays information resources accumulated in store 32A of a server 32, such as a web page and a program, and transmits them to a host computer 11.

[0048] The network connection section 22 for a printer 21 to perform data communication between host computers 11, Other network connection sections 23 for performing data communication between the Internet 31, The proxy server section 24 which is prepared between each network connection section 22 and 23, and relays the data communication between a host computer 11 and a server 32, It has the printing control section 25 which interprets print data and generates a printing image data, and the engine control section 26 for controlling the print engine 27.

[0049] Drawing 2 is the block diagram showing the functional structure of a printer 21. The proxy server

section 24 as a "junction means" is equipped with the request receive section 41, the data control section 42, the access hysteresis managed table 43, a cache 44, the request creation section 45, the response receive section 46, the response creation section 47, and the updating control section 48 so that it may mention later, respectively.

[0050] The request receive section 41 receives the HTTP request inputted through the network connection section 22 grade from the host computer 11. The request creation section 45 creates a new HTTP request based on the HTTP request from a host computer 11. That is, by rewriting the IP address stored in the header of a HTTP request to the IP address to which it was assigned by the printer 21, the HTTP request creation section 45 creates a HTTP request so that the proxy server section 24 can receive the data from a server 32.

[0051] The response receive section 46 receives the HTTP response transmitted from the server 32. The response creation section 47 creates the HTTP response for transmitting to a host computer 11. The response creation section 47 adds the IP address of a host computer 11 to the information resource saved into the newest information resource or newest cache 44 received from the server 32, and creates a HTTP response. Moreover, the response creation section 47 can change into a format of GIF (Graphics Interchange Format), JPEG (JointPhotographic Experts Group), PDF (Portable Document Format), etc. the printing image data inputted from the printing control section 25, and can also create the HTTP response containing this printing image data. In addition, it is not necessary to perform format conversion of a printing image data in the response creation section 47, and it may be made to perform format conversion by the printing control-section 25 side.

[0052] The data control section 42 as a "data control means" will judge whether with reference to the access hysteresis managed table 43 later mentioned with drawing 3, the demanded information resource is saved into the cache 44, if the HTTP request from a host computer 11 is received. And read the data saved into the cache 44 when the demanded information resource was saved into the cache 44, and it is made to transmit to a host computer 11, when the demanded information resource is not saved into a cache 44, the Internet 31 is accessed, and the data control section 42 acquires the newest information resource, and makes the newest information resource transmit to a host computer 11. Moreover, the data control section 42 can request generation of a printing image data from the printing control section 25, and can also make the printing image data inputted from the printing control section 25 transmit to a host computer 11 according to the demand from a host computer 11. In addition, the function which controls an access permission may be prepared in the data control section 42, and you may constitute so that data communication may be allowed only between the servers permitted beforehand. When the request which breaks access restriction is received, the data control section 42 makes the response which refuses this access generate, and is made to answer a host computer 11.

[0053] For example, the access hysteresis managed table 43 which can be expressed as a hysteresis management tool has matched and managed the information (all over drawing, it is written as the "address") for specifying information resources, such as URL, the storing place address to a cache 44, the amount of data, preservation time, the storing place address of a printing image data, access frequency, and the flag of printing propriety, as shown in drawing 3 (a). Therefore, the data control section 42 can judge whether the information resource demanded from the host computer 11 is saved into the cache 44 by referring to the access hysteresis managed table 43 by using URL etc. as a search key. In addition, the management storage not only of this but the access log of which information resource to have accessed when every host computer 11 can be carried out. Moreover, a printing propriety flag is suitably used in the gestalt of other operations mentioned later.

[0054] It returns to drawing 2. The cache 44 as a "preservation means" is preferably formed in storage comparatively rewritable [with large capacity], such as a hard disk drive unit. The printing image data of an information resource also saves a cache 44 while it carries out are recording preservation of the information resource received from the server 32.

[0055] When it judges whether the updating demand occurred about the information resource set up beforehand and an updating demand occurs, it connects with a server 32, and the updating control section 48 receives the newest information resource, and makes the contents of the cache 44 update.

Here, the information resource about a printer 21 is contained in the information resource set up beforehand. As an information resource about a printer 21, document data, such as a program of a printer driver, a printer utility, etc. and an operation manual of a printer 21, can be mentioned, for example.

[0056] In addition, the judgment of whether the updating demand occurred can be performed by the following approaches. The 1st approach is the approach of connecting with a server 32 as what the updating demand generated, when it supervises whether the predetermined time set up beforehand passed and predetermined time passes. The 2nd approach is an approach of judging the notice of updating from a server 32 to be what the updating demand generated when waiting and the notice of updating are received. The 3rd approach is the approach of judging to be what the updating demand generated, when the next updating scheduled day is announced beforehand on the server 32 and this updating scheduled day comes. According to the 1st approach, in order to generate an updating demand for every predetermined time, possibility of not being updated even if it connects with a server 32 is high, and useless access occurs. However, since the existence of renewal of an information resource can be easily judged with the HEAD command, if it chooses a time zone with few communication link loads and is made to connect with a server 32 for example, an updating demand can be generated with a simple configuration. Therefore, with the gestalt of this operation, although the 1st approach is adopted, this is an example and this invention is not limited to this. The 2nd approach and 3rd approach of reducing useless access can also be adopted, or other approaches can also be adopted.

[0057] The printing control section 25 as a "printing control means" is equipped with the receive buffer 51 which receives print data etc., the interpretation section 52 which interprets print data etc. and generates a printing image data etc., and the output buffer 53 which stores the generated printing image data. The generated printing image data is inputted into the engine control section 26, and predetermined printing is performed when the engine control section 26 controls the drive of the print engine 27. Moreover, the printing control section 25 generates the printing image data of the specified information resource according to the demand from the data control section 42. An example of print data characteristic of this invention is shown in drawing 3 (b). When directing printing of the information resource perused by the browser 12, from a host computer 11, the print data 61 of structure as shown in drawing 3 (b) are inputted. That is, print data 61 are equipped with printing instruction storing field 61A which stores a printing instruction, and information storing field 61B for specification which stores the information for specifying the information resource which should be printed. The printing control section 25 interprets information for specification, such as URL stored in information storing field 61B for specification, and prints by the information resource shown using this information for specification coming to hand from a cache 44. In addition, all the information inputted not only from this but from the host computer 11 may be interpreted in the data control section 42, and although the case where print data 61 are interpreted by the printing control section 25 is illustrated, you may constitute from a gestalt of this operation so that only the information about printing may be handed over to the printing control section 25.

[0058] Next, the outline structure of the user interface of a browser 12 is shown in drawing 4. As shown in drawing 4 (a), the carbon buttons 73-76 which display the display 71 for a browser 12 to display a web page etc., the addressing section 72 for inputting URL etc., and each menu, such as "retrieval", a "favorite", "printing", and "a preview", are formed. In addition, the menu shown in drawing 4 is instantiation, for example, may prepare other menu buttons, such as "a termination", "it returning", and "progressing", and can also double and adopt a pull down menu.

[0059] When using the web page of a server 32, a user inputs URL for specifying a desired web page as the addressing section 72. Thereby, a desired web page is transmitted through the proxy server section 24 of a printer 21, and it is displayed on a display 71.

[0060] When you wish printing of the web page which came to hand, a user can make it print by operating a print button 75 with devices, such as a mouse. Moreover, the preview carbon button 76 is operated to check the condition of printed matter beforehand before printing. If the preview carbon button 76 is operated, a printer 21 will generate the printing image data based on the printing engine

performance of self, and will transmit it to a host computer 11. For example, when a printer 21 is a color printer, a color printing image is displayed on a display 71, and when a printer 21 is a monochrome printer, a monochrome printing image is displayed on a display 71. In addition, as shown in drawing 4 (b), the preview carbon button 81 can also be displayed in a display 71 by HTML, Java (architecture which SUN Microsystems and Inc. developed being neutral object oriented programming language trademark of the company), etc. In this case, it is desirable to adopt the approach shown in drawing 4 (b) in that the preview carbon button 81 can be added, since it is advantageous, without adding modification to a browser 12.

[0061] Next, an operation of the gestalt of this operation is explained based on drawing 5 - drawing 8. In addition, all over drawing, a step is written as "S."

[0062] The flow chart of drawing 5 shows the junction processing for relaying information resources, such as a data file and a program file, between a host computer 11 and a server 32. First, in S1, it supervises whether the request (HTTP request) was received from the browser 12. When a request is received, it judges whether the demanded file is saved into the cache 44 by analyzing URL (S2) and referring to the access hysteresis managed table 43 (S3).

[0063] When the demanded file is saved into the cache, it judges whether it is in agreement with the former file on whether this file is effective and a server 32 (S4). For example, it can be checked by using the HEAD command of HTTP etc. whether the file on a server 32 has been updated. Therefore, in S4, a server 32 can be accessed and it can judge whether the file on a server 32 and the file in a cache 44 are the same.

[0064] When the file in a cache 44 is effective, the demanded file is read from a cache 44 and it transmits to a browser 12 (S5). When the demanded file is not saved in the cache 44 on the other hand (S3:NO), or when the file saved into the cache 44 is old (S4:NO), a server 32 is accessed and the newest file is acquired (S6), and while transmitting this newest file to a browser 12, it saves also into a cache 44 (S7).

[0065] Thus, a file is acquired from any of a cache 44 or a server 32, and it transmits to a browser 12. Next, it judges whether the print preview was required (S8). When a print preview is required, the printing image data which (S8:YES) and the printing control section 25 generate is acquired, it transmits to a browser 12, (S9) and a printing image data are saved into a cache 44, and processing is ended (S10). When the print preview is not demanded, (S8:NO) and processing are ended. It is not necessary to make the whole printing image data save into a cache here. For example, only data with high operating frequency may be made to save into a cache like the data which image generation takes time amount like image data, or font data.

[0066] Thus, since the proxy server section 24 relays between a host computer 11 and servers 32, the information resource which the browser 12 of a host computer 11 requires can be made to save into a cache 44 in junction processing.

[0067] Next, the flow chart of drawing 6 shows printing processing. In S1, it is supervising whether data etc. were received from the host computer 11 (S21). When data etc. are received, it judges whether it is a printing instruction (S22). When it is a printing instruction, as shown in whether (S22:YES) and URL are specified and drawing 3 (b), it judges whether URL is stored in information storing field 61B for specification (S23).

[0068] When URL is specified, the storing place of the specified file is detected with reference to the (S23:YES) access hysteresis managed table 43 (S24), and the data of a file with which printing was directed are read from a cache 44 (S25). And a printing image data is made to change and print this file (S26). Here, when the printing image data is already generated according to the demand of a print preview, it can print promptly by reading this printing image data.

[0069] In addition, since it is the case where the status demand command for checking a toner, a form residue, etc. is received when the data received from the host computer 11 are not a printing instruction (S22:NO), or when URL is not specified (S23:NO), processing is usually performed (S27).

[0070] Thus, in printing processing, since the data saved into the cache 44 can be read and printed, it is not necessary to transmit the data which should be printed from a host computer 11 to a printer 21 like

the conventional technique.

[0071] Next, the flow chart of drawing 7 shows the update process. First, in S31, it is supervising whether the updating demand occurred about predetermined information resources, such as a printer driver and a printer utility, (S31). It can judge whether the updating demand occurred by the notice from elapsed time or a server 32.

[0072] When an updating demand occurs, it connects with the predetermined server 32 which offers the printer driver etc. (S32), and judges whether the printer driver etc. is updated (S33). When the printer driver etc. is updated, the newest program is downloaded from (S33:YES) and a server 32 (S34). And the contents of storage of a cache 44 are made to update (S35), and connection is ended (S36). On the other hand, when the printer driver etc. is not updated, (S33:NO), and S34 and S35 are skipped, and connection is ended (S36).

[0073] Next, the flow chart of drawing 8 shows the cache management processing for managing a cache 44. First, in saving a file into a cache 44, it judges whether the current availability (S41) of a cache 44 and the amount of data (S42) of the file which it is going to save are detected, respectively, both are compared, and a file can be saved into a cache 44 (S43). When the availability of a cache 44 exceeds the amount of data of a file, this file is saved into a cache 44 (S44). On the contrary, when the availability of a cache 44 is under the amount of data of a file, with reference to the (S43:NO) access hysteresis managed table 43 (S45), the fewest file of access frequency is deleted from a cache 44 (S46), and it returns to S41 again. Thus, the fewest file of access frequency is deleted from the cache 44 until the availability of a cache 44 increases and it exceeds the amount of data of a file. Here, when there is a printing image data related with the deletion file, unless it is used by other files in common, this printing image data can be deleted.

[0074] Thus, according to the gestalt of this implementation constituted, the following effectiveness is done so.

[0075] Since the proxy server section 24 is formed in a printer 21 and a printer 21 relays [1st] the data transfer between a host computer 11 and a server 32, it is not necessary to transmit data to a printer 21 anew from a host computer 11 at the time of printing, and the communication link load of a network 1 can be reduced.

[0076] At the time of a print preview, since the printing image data generated by the printer 21 side can be transmitted to a host computer 11, to the 2nd, a user can check the printing image which made the actual printing engine performance reflect, can prevent useless printing to it, and can raise user-friendliness to it. Since the information resource which transmitted the printer 21 to the host computer 11 by the junction function as above-mentioned is accumulated, the time and effort which transmits the data for print previews to a printer 21 from a host computer 11 cannot be needed, the image data for print previews can be generated promptly, and it can be made to display on a browser 12 especially.

[0077] When accessing [3rd] the Internet 31, since the printer 21 used for printing by choosing the proxy server section 24 can also be chosen as coincidence, a host computer 11 can perform selection of the proxy server section 24, and selection of a printer 21 by one actuation, and its user-friendliness improves.

[0078] Since a printer 21 updates and manages predetermined information resources, such as a printer driver, a user can obtain [4th] a required program etc. easily from a printer 21, without accessing the Internet 31. The required program is made to read into each host computer 11 from record media, such as CD-ROM enclosed by the printer, conventionally, respectively, and moreover, since each host computer 11 accessed the Internet 31 variously, respectively and the printer driver etc. was updated, the use environment of a printer tends to be different every host computer 11. However, with the gestalt of this operation, since oneself can manage the program and documents about self, each host computer 11 can obtain the newest printer driver etc. only by connecting with the printer 21 using, and a printer 21 can unify the printer use environment in office.

[0079] Since a printing image data and an information resource are related with the 5th and it saves into a cache 44, to the print preview demand of the 2nd henceforth, a printing image data can be more promptly transmitted to a browser 12, and user-friendliness improves.

[0080] Since it deletes from few [access frequency] information resources when the availabilities of a cache 44 run short, the comparatively high information resource of access frequency can be stored up into a cache 44, and the response time can be shortened [6th].

[0081] 2. Explain the gestalt of operation of the 2nd of this invention based on the gestalt next drawing 9 , and drawing 10 of the 2nd operation. In addition, with the gestalt of this operation, the same sign shall be given to the same component as the gestalt of the 1st operation mentioned above, and the explanation shall be omitted. The description of the gestalt of this operation is in the point of refusing printing, when the information resource which a host computer 11 requires inspects whether the predetermined criteria are met and does not meet the predetermined criteria.

[0082] Drawing 9 is a flow chart which shows junction processing of the network printing system by the gestalt of this operation, and this processing is equipped with all the steps of S1-S10 which are shown in drawing 5 . In addition, in this processing, after acquiring the newest file from a server 32 and making it transmit to a host computer 11 side (S6, S7), when this file judges whether the predetermined criteria are met (S51) and does not meet the predetermined criteria, as shown in (S51:NO) and drawing 3 (a), it sets improper [printing of a printing propriety flag] (S52). Here, with predetermined criteria, it can mention whether it is a vicious and antisocial thing like obscene image data or counterfeit currency image data. Various things are employable as the inspection approach of whether to meet the predetermined criteria. For example, the 1st approach is an approach the network administrator inputs the IP address of a vicious site into the proxy server section 24 of each printer 21 beforehand. a ***** [that, as for the 2nd approach, a predetermined phrase appears] -- or it is the approach of judging whether the frequency of occurrence of a predetermined phrase etc. being measured and this meeting the predetermined criteria.

[0083] Next, drawing 10 showed the flow chart of the printing processing concerning the gestalt of this operation, and this processing is equipped with all the steps of S21-S27 which are shown in drawing 6 . In addition, in this processing, after detecting the storing place address of the file to which printing was directed, it judges whether printing is permitted with reference to (S24) and the printing propriety flag of this file (S61). When printing is permitted, a file is read from (S61:YES) and a cache 44, and a printing image data is generated and printed (S25.S26). When printing is not permitted, the purport to which printing is not permitted to (S61:NO) and a user is notified (S62).

[0084] Thus, also with the gestalt of this implementation constituted, the same effectiveness as the gestalt of the 1st operation mentioned above can be acquired. In addition, since printing is refused when an information resource inspects whether the predetermined criteria are met and does not fill the predetermined criteria with the gestalt of this operation, printing of an antisocial file etc. can be prevented beforehand. If it only displays on a monitor especially, there are few problems, but when it prints as printed matter, it is much more effective to forbid printing of the file which cannot be disregarded.

[0085] In addition, if it is this contractor, additions various by within the limits of the summary of this invention indicated by the gestalt of each operation, modification, etc. are possible. For example, this invention is also realizable by making the computer of a printer 21 read the predetermined program recorded on the record medium MM shown in drawing 1 .

[0086] Moreover, when it mounts two or more browsers in a host computer, the printer used for every browser can also be changed. That is, one browser can access the Internet through the proxy server section of a color printer, and the browser of another side can also access the Internet through the proxy server section of a monochrome printer.

[0087] Furthermore, although the case where a printing image was transmitted to a host computer 11 was mentioned as the example with the gestalt of said the operation of each when a print preview was directed, it may replace with this, the information resource received from the server 32 may be changed as much as possible into a printing image within a printer 21, and you may transmit to a host computer 11. In this case, for example, it can express as follows.

[0088] The host computer which directs printing of this information resource while requiring acquisition of the information resource saved at the server on an expression 1. network, In the network printing

system equipped with the printer which receives and prints the information resource of which acquisition was required from this host computer from said server said host computer The acquisition demand means for requiring acquisition of said information resource of said printer, It has a printing directions means to direct printing of the information resource acquired by said acquisition demand means to said printer. Said printer While acquiring the information resource demanded from said acquisition demand means from said server and saving it The network printing system characterized by having a junction means to transmit to said host computer by making this information resource into a printing image data, and the printing control means which makes the information resource saved for said junction means read and print based on the directions from said printing directions means.

[0089] Moreover, in the case of the information resource which does not meet the predetermined criteria, it can also constitute so that the reception from a server 32 may not permit the preservation to a cache 44, either.

[0090] Furthermore, according to the size of communication link cost, you may constitute so that the preservation to a cache 44 may be permitted. For example, like a its company homepage, it may not be made to save into a cache 44 in the case of the information resource which communication link cost does not cut in the remainder to reception of data, but only the information resource which communication link cost requires like an external homepage may be saved into a cache 44.

[0091] Furthermore, the compound machine equipped with other functions, such as not only a printer special-purpose machine but a copying machine, facsimile apparatus, etc., as a printer may be used.

[0092]

[Effect of the Invention] Without increasing the communication link load between a host computer and a printer according to the network printing system, network printer, and the network printing approach concerning this invention as explained above, a printing image data can be displayed or it can be made to print.

[0093] Moreover, in order to manage the information resource about a printer for printer itself, each host computer can obtain the newest required information resource easily from a printer, and becomes easy to unify the printer use environment in office.

[Translation done.]